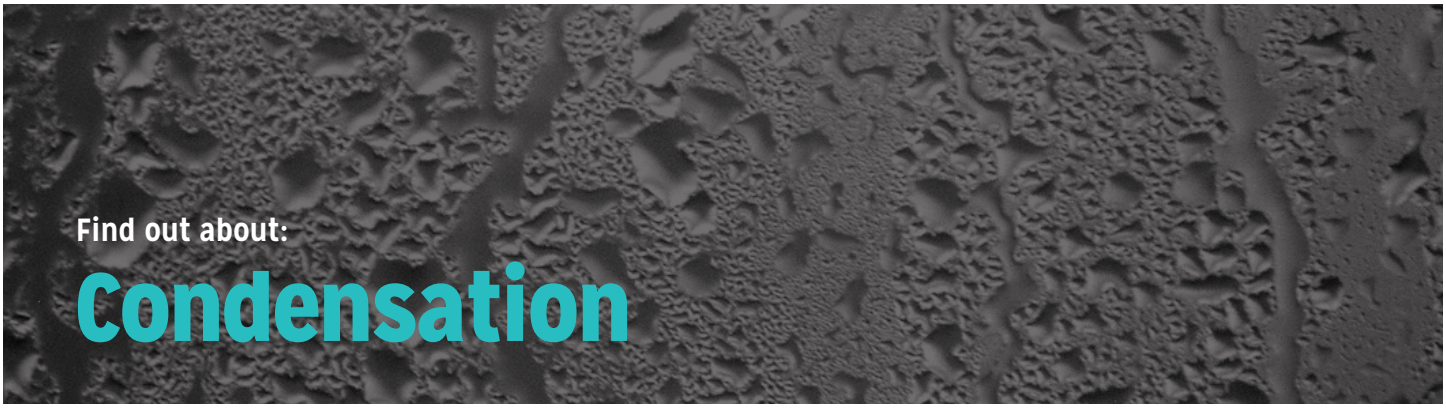

Find out about:

Condensation

Have you noticed that the windows in your home are continually fogging up? Does it seem like they are collecting moisture? This isn't necessarily your windows' fault. In fact, window condensation may be an indicator of something entirely different. Your foggy windows may be an indicator that you need to reduce indoor humidity before it causes hidden, costly problems elsewhere in your home like peeling paint, rotting wood, buckling floors, insulation deterioration, mildew, even moisture spots on ceilings and walls.

What causes condensation?

Specific conditions may cause condensation with energy efficient windows or doors.

During very cold weather, some condensation or even frost can form along the bottom edge of the glass where the temperature is the coldest.

Because the low-e coating that keeps the heat inside also causes the glass surface to cool, condensation may form:

- On the outside glass surface in the summer and early fall when there is high outdoor humidity in combination with a windless cool night.
- On the inside glass surface at any time during the year if there is a low-E coating on that surface and if there is enough humidity in the house to form condensation.

As the weather begins to change and temperatures begin to drop, we often receive questions from concerned clients about condensation on their newly installed windows. To answer the question right away: no, there is nothing wrong with your new windows or patio doors. In fact, it is quite common for your units to initially experience more condensation than the old windows. But it is still a good idea to try and understand WHY this is happening in your home.

Why does condensation occur on windows?

Condensation happens when moisture present in the warm air changes into a liquid on contact with colder surfaces such as a glass pane. Essentially it is a by product of warm air meeting cold air.

At any given temperature, the air can only hold a certain amount of moisture as vapour. The temperature at which moisture becomes saturated is called the dew point. **It is also important to remember that warm air can hold much more moisture than cooler air.** For example, air at +20°C can hold nine times as much moisture as air at -10°C. As the air in your home cools down, the saturation increases causing moisture to condense.

In theory, condensation in your home can be reduced by decreasing inside temperature, or decreasing humidity.

In practice however, several factors contribute to the humidity levels in your home: the window itself, how it was installed, interior window accessories (curtains, blinds), and even the arrangement of heat sources in your home.

Energy efficient units are less likely to have condensation form on the glazing. But when you install new frames the humidity in your home is likely to rise during colder months. This is because your windows don't allow warm moist air to escape the house and be replaced by less humid outdoor air. The tradeoff is that increased humidity created by your new units will improve the comfort in your home. But a house with a humidity level of more than 40 percent, with the outside temperature of -20°C may cause condensation even on an energy efficient window.

Do windows cause condensation?

No. Windows do not cause condensation. But, windows are often the first place where condensation can be seen. Think about it. You're probably not surprised or concerned when your bathroom mirror becomes fogged. You expect it after a hot shower. Your car windows fog up in humid weather or in winter when you have several passengers. These are just a few examples. And although condensation usually occurs in cold weather, it can occur during humid months when air conditioning is running. The mirror doesn't cause the condensation. The car windows don't cause it either. These are just the first places you actually see condensation. Check your bathroom walls after a shower – you'll see condensation there, too. Run your finger along the wall. You'll see water on your finger, and you'll see the trail of your finger through the condensation on the wall. The same is true for the windows in your home.

How to recognize bad condensation?

There is actually one type of condensation that is bad. This is condensation that appears on the inside of the insulated glass unit in your window. Run a finger or cloth on the window glass pane. If you can wipe the condensation away, this is the acceptable kind of condensation. If you try to wipe it off, and the condensation doesn't go away, it is probably on the inside of the sealed unit.

Why is this bad?

The answer lies partially in the terminology. Insulated glass units, or as they are sometimes called "sealed units" actually contain an inert gas fill. The gas helps further reduce heat loss from your home through the windows. In order for the glass unit to function efficiently it is imperative that these units are sealed and do not leak gas or allow air in.

Condensation on the inside of the sealed unit is a sure sign of the unit's failure. Because moisture is accumulating on the inner side of the pane, this most likely means that air is seeping somewhere into the unit, while losing gas at the same time. Part of the problem here is that the sealed unit failure may not be physically visible and the window may still look like it functions fine.

Can you control the amount of condensation inside your house?

By controlling the humidity levels inside your home it can help to decrease the amount of condensation on your windows. To achieve this, reference the chart below showing what the *recommended indoor relative humidity levels* are for a particular outdoor temperature. Since the temperatures in our our climate fluctuate throughout the year, so does the recommended indoor relative humidity levels.

What is Relative Humidity?

Relative humidity is the ratio of the actual amount of water vapour present in a volume of air at a given temperature to the maximum amount that the air could hold at that temperature. This amount is expressed as a percentage. Warm air can hold more water vapour than cool air, so a particular amount of water vapour will yield a lower relative humidity in warm air than it does in cool air.

Recommended Indoor Relative Humidity

Outdoor Air Temperature (Farenheit)	Outdoor Air Temperature (Celcius)	Indoor Relative Humidity (%RH)
20° to 40°F	-7° to 4°C	≤ 40%
10° to 20°F	-12° to -7°C	≤ 35%
0° to 10°F	-18° to -12°C	≤ 30%
-10° to 0°F	-23° to -18°C	≤ 25%
-20° to -10°F	-29° to -23°C	≤ 20%
Below -20°F	Below -29°C	≤ 15%